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DISPENSING NOZZLEFIELD OF INVENTION

This invention relates to nozzle assemblies and more particularly to nozzle assemblies suitable for dispensing liquified petroleum gas.

BACKGROUND ART

Although the prior art contains a wide variety of liquified petroleum gas dispensing nozzles, none incorporates a satisfactory locking arrangement that will prevent accidental uncoupling of the nozzle from a tank whilst the dispensing valve of the nozzle is open.

A further shortcoming of the prior art is that known nozzles do not provide for staged reduction of the pressure within the gas reservoir of the nozzle when the dispensing valve is being opened. Thus, the operator must overcome the full pressure of the gas supply in order to open the dispensing valve.

DISCLOSURE OF THE INVENTION

According to one aspect of the invention there is provided a dispensing nozzle having a connector adapted to couple the nozzle to a tank or the like and valve means operable by a lever to open and close the nozzle characterised by the provision of locking means operable to prevent uncoupling of the connector whenever the lever is in its position which opens the valve.

According to another aspect of the invention there is

provided a dispensing nozzle having a connector adapted to couple the nozzle to a tank or the like, a reservoir within the nozzle in communication with the fluid entering the nozzle, a main valve operable to open and close the nozzle, pressure release means operable to reduce the pressure at the main valve at the commencement of opening of the main valve.

According to yet another aspect of the invention there is provided a dispensing nozzle comprising a body adapted to be connected to a supply of fluid, an outlet through which the fluid is dispensed from the nozzle, a fluid reservoir within the nozzle in communication with the supply of fluid, a main valve normally held closed by the pressure within the reservoir, pressure release means adapted to reduce the pressure at the main valve and means for operating the pressure release means so as to reduce the pressure in the reservoir and then to operate the main valve so as to open the nozzle.

In a preferred form of the invention the pressure release means is in the nature of a dashpot defined by a fixed cylinder and a movable piston valve.

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be more readily understood and put into practical effect, reference will now be made to the accompanying drawings in which:-

Fig. 1 is a front perspective view of a dispensing nozzle according to one embodiment of the invention,

Fig. 2 is a rear perspective view of the dispensing nozzle shown in Fig. 1,

Fig. 3 is a cross-sectional view of the dispensing nozzle shown in Figs. 1 and 2 with the main valve closed,

Fig. 4 is an enlarged, partially cutaway view similar to Fig. 3 but with the main valve open,

Fig. 5 is an enlarged, cutaway view of the lever locking arrangement prior to engagement, and,

Fig. 6 is a view similar to Fig. 5 with the lever locked in the open position.

DESCRIPTION OF PREFERRED EMBODIMENT

The nozzle assembly shown in the drawings includes a hollow body 10 having a connector piece 11 adapted to be connected to a supply line. The nozzle is operated by lever 12 that pivots about lever pin 13 and which is protected by guard 14.

A swivel nut 15 mounted over the outlet end 16 of the nozzle extends rearwardly towards the lever guard 14. The swivel nut 15 rotates on balls 17 that are accessible through ball plug 18. The swivel nut 15 has a threaded insert 19 by means of which the nozzle is connected to a L.P.G. tank of, say, a vehicle (not shown). Whenever the nozzle is open, rotation of the swivel nut 15 with respect of the body 10 is prevented by pin 20 engaging one of recesses 21 formed around the rear face of the swivel nut 15 whenever the nozzle is open.

The coupler portion of the nozzle includes a pressure release means comprising a dashpot system that consists of a cylinder 22 and a piston valve 23. As can be seen in Figs. 3 and 4 there is a small (say 1mm) annular clearance between the cylinder 22 and the piston valve 23 to allow leakage to occur as described below. The cylinder 22 is located within a valve body 24, the hollow interior of which constitutes the gas reservoir, and is held in position by filter body 25 which supports a filter 26 and which is secured by means of circlip 27. A nose piece 28 is biased towards the position shown in Fig. 3 by a nose piece spring 29 positioned between the recessed end face of nose piece 14 and the recessed front face of a slide sleeve 30 that is mounted around the front end of the body 10 and the valve body 24.

15 An "O" ring 31 seals the valve body 24 with respect to the body 10 and slide sleeve spring 32 connected between a rearwardly facing shoulder of the slide sleeve 30 and a forwardly facing shoulder of the valve body 24 acts as a return spring which comes into operation when the nozzle is being disconnected.

20 A piston valve seat 33 located at the downstream end of the valve body 24 is engaged by the front end of the piston valve 23 when the nozzle is closed. An "O" ring 34 at the end of valve body 24 seals the valve body 24 with respect to the centrally located, rearwardly extending projection of the nose piece 28 when the nozzle is open. The nose piece 28 has a gas passageway 35 and an actuating abutment 36.

In operation, the swivel nut 15 is connected to an adaptor on the L.P.G. tank of a vehicle and in so doing, the nose piece 28 is forced to the right of Fig. 3 against the operation of nose piece spring 29 to close the gap between the upstream end of the nose piece 28 and the downstream end of the slide sleeve 30. At the same time, the gap between the abutment 36 of the nose piece 28 and the front face of the piston valve 23 is narrowed by the same amount.

The trigger lever 12 is then operated by moving its lower end to the right in Fig. 3 whereby its upper end pivots about pin 13 and drives the valve body 24 towards the nose piece 28. The abutment 36 of the nose piece 28 then lifts the front face of the piston valve 23 from its seat 33.

The pressure within the dashpot formed by the cylinder 22 and piston valve 23 is normally set by flow of L.P.G. from the body 10 through a bleed hole 37 on the axis of the cylinder 22. When the piston valve 23 is lifted from its seat 33, the pressure in the dashpot chamber is reduced by leakage through the annular gap described above to enable easy opening of the main valve 23, 33 by further movement of the lever 12.

The main valve 23, 33 is fully opened by further movement of valve body 24 towards the nose piece 28 (caused by further movement of lever 12) which moves the valve seat 33 away from the front end face of piston valve 23 against the action of spring 32. When the nozzle is open, the pin 20 engages one of the recesses 21 to prevent rotation of the

swivel nut 15.

When the valve 23,33 is cracked, the gas escapes from the dashpot 22, 23 faster than gas enters the passageway 37 and thus the pressure in the dashpot is reduced. The piston
5 valve 23 is forced into the cylinder 22 against the action of spring 38 to open fully the valve 23, 33 (see Fig. 4). Gas then flows, at full pressure, in the path shown by the arrows in Fig. 4 from connector 11, through the reservoir formed by
10 the valve body 24, through the ports 40 at the upstream end of cylinder 22, around the dash pot 22, 23 and through the ports 39 in the abutment 36 of the nose piece 28 to be delivered through passageway 35.

The lever 12 is held in the open position by a latch 41 which mounted on pin 42 in the guard 14 and biased by latch
15 spring 43 - see Figs. 5 and 6. The hooked end 44 of the latch 41 engages latch pin 45 in the end of the lever 12.

When the trigger lever 12 is released, the piston valve 23 closes against the valve seat 33 and the nose piece 28 is disengaged from the "O" ring 34. The locked up volume of
20 L.P.G. is then discharged to atmosphere.

Various modifications may be made in details of design and construction without departing from the scope and ambit of the invention.

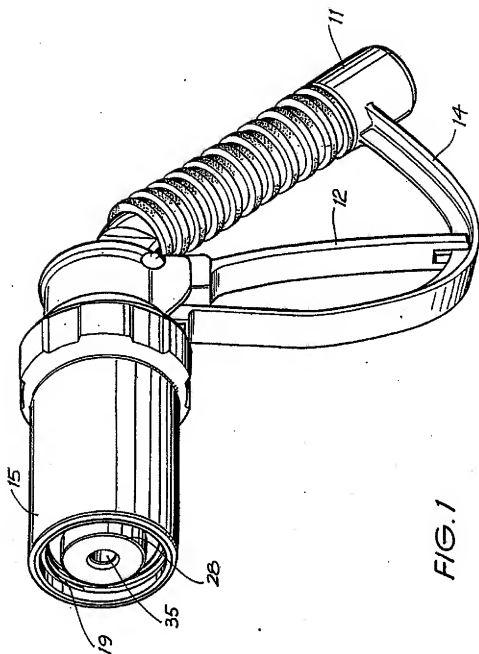
CLAIM

1. A dispensing nozzle having a connector adapted to couple the nozzle to a tank or the like and valve means operable by a lever to open and close the nozzle characterised by the provision of locking means operable to prevent uncoupling of the connector whenever the lever is in its position which opens the valve.
2. A dispensing nozzle according to claim 1 wherein the locking means comprises a pin actuated by the lever to engage one of a plurality of recesses formed in the connector.
3. A dispensing nozzle having a connector adapted to couple the nozzle to a tank or the like, a reservoir within the nozzle in communication with the fluid entering the nozzle, a main valve operable to open and close the nozzle, pressure release means operable to reduce the pressure at the main valve at the commencement of opening of the main valve.
4. A dispensing nozzle comprising a body adapted to be connected to a supply of fluid, an outlet through which the fluid is dispensed from the nozzle, a fluid reservoir within the nozzle in communication with the supply of fluid, a main valve normally held closed by the pressure within the reservoir, pressure release means adapted to reduce the pressure at the main valve and means for operating the pressure release means so as to reduce the pressure in the reservoir and then to operate the main valve so as to open

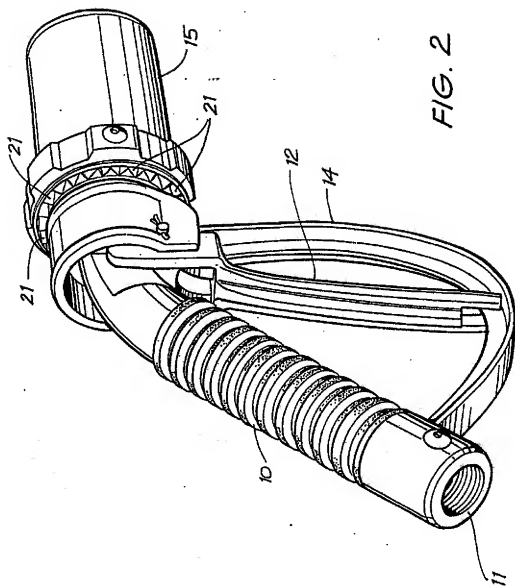
the nozzle.

5. A dispensing nozzle according to claim 3 or claim 4 wherein the pressure release means comprises a dashpot defined by a fixed cylinder and a movable piston, there being an annular gap therebetween to allow bleeding of the gas enclosed therein when the main valve is initially opened.

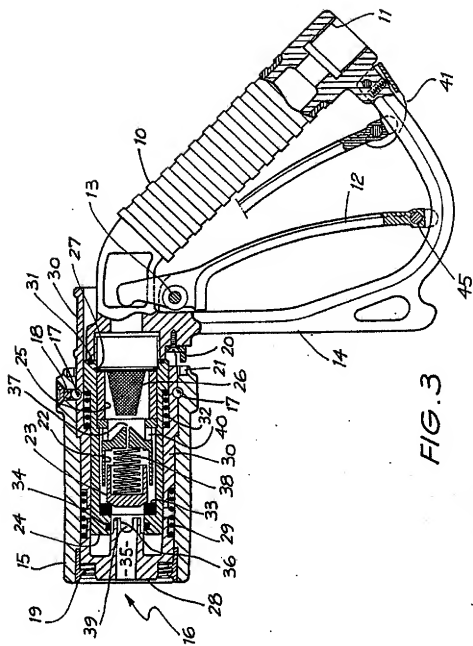
6. A dispensing nozzle according to claim 5 wherein the cylinder has a passageway which communicates the interior of the passageway with the reservoir to enable pressurisation of the dashpot when the nozzle is closed.



SUBSTITUTE SHEET



SUBSTITUTE SHEET



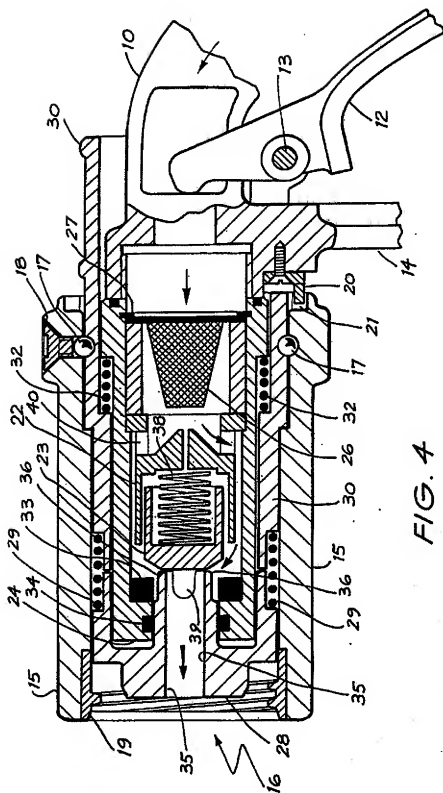
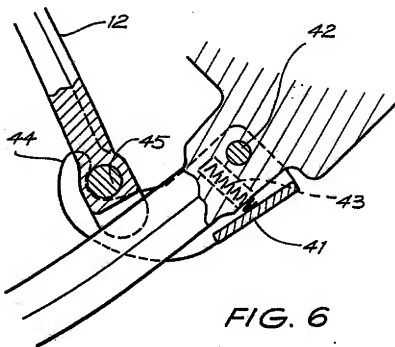
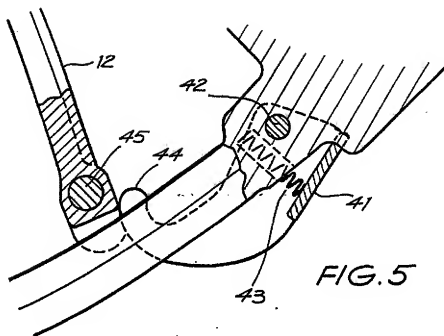


FIG. 4

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INTERNATIONAL SEARCH REPORT

International Application No. PCT/AU 87/00300

I. CLASSIFICATION OF SUBJECT MATTER : 1. International Classification symbols apply, indicate only. According to International Patent Classification (IPC) or to both National Classification and IPC Int. Cl. 4 B67D 5/37	
II. FIELDS SEARCHED Minimum Documentation Searched : Classification System : Classification Symbols : IPC B67D 5/37, 5/375, 5/377	
Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched : AU : IPC as above	
III. DOCUMENTS CONSIDERED TO BE RELEVANT Category * 1 Citation of Document, ** with indication, where appropriate, of the relevant passages ** Relevant to Claim No. **	
X	EP, A, 39977 (NEDERLANDSE CENTRALE ORGANISATIE VOOR TOEGEPAST-NATUUR WETENSCHAPPELIJK ONDERZOEK) 18 November 1981 (18.11.81) See, for instance, Times 11 to 13 of page 4 (1)
A	DE, A, 3313258 (C.K. WALTHER GmbH & CO. KG) 18 October 1984 (18.10.84) (1,2)
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X	GB, A, 735364 (AVERY-HARDOLL LTD) 17 August 1955 (17.08.55) (3,4)
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IV. CERTIFICATION Date of the Actual Completion of the International Search : 27 November 1987 (27.11.87) International Searching Authority : Australian Patent Office Date of Mailing of this International Search Report : 03.12.87 3 DECEMBER 1987 Signature of Authorizing Officer : <i>B. Murray</i>	